HU-017ASW RDA5807 87-108MHz FM Radio DIY Kit

1.Introduction:

HU-017ASW is an RDA5807 87.0MHz-108.0MHz Wireless FM Radio Receiver DIY Kit with 4bit digital tube. It uses the 87-108MHz global FM receiving frequency band, which can meet the FM needs of users around the world. It provides two power supply modes for users to use at home or outdoors.

It is a very interesting DIY electronic product which enables users to understand the circuit more clearly and learn soldering skills.

2.Feature:

1>.87.0MHz-108.0MHz FM Radio: Built in RDA5807 FM data processor with standard FM receiving frequency band, applicable to any country and region in the world. Adjustable FM frequency by press F+ and F- buttons.

2>.Adjustable Volume: It provides two volume adjustment methods: button and potentiometer. 15 volume levels.

3>.Active & Passive Audio Output: It not only has built-in 0.5W power amplifier to directly drive 8ohm speakers,but also outputs audio signal to the headset or loudspeaker with AUX interface.Realize personal listening and sharing of FM audio.

4>.Configure 25cm dedicated FM antenna and 4Bit red digital tube.Real time display of FM radio frequency.Transparent acrylic shell protect the internal circuit board. Dual power supply methods: 5V USB and 3V battery.

5>.DIY Hand Soldering. It’s a DIY kit which comes with various components. User need to install each component by hand. It not only can exercise and improve soldering skills, but also increase the interest in electronic technology. Great for electronics hobbyists, beginners, school and home education.

3.Parameter:

1>.Product Name: HU-017ASW RDA5807 87-108MHz FM Radio DIY Kit
2>.Work Voltage:DC 3V/5V
3>.Output impedance:8ohm
4>.Output power:0.5W
5>.Output channel:Mono
6>.Receiver Frequency:87.0MHz~108.0MHz
7>.Frequency accuracy:0.1MHz
8>.Work Temperature:-40℃~85℃
9>.Work Humidity:5%~95%RH
10>.Size(Installed):107*70*23mm

4.Use Methods:

1>.Switch Toggle Switch to turn ON/OFF work power supply.

2>.Press V+ or V- to adjust volume. 15 volume levels. Continuously adjust the volume while holding down the button.

3>.Press F+ or F- to adjust receive frequency or FM station. Continuously adjust the frequency while holding down the button.

4>.Potentiometer: It is used to adjust volume by screwdriver.

5.Component Listing:

NO.	Component Name	PCB Marker	Parameter	QTY
1	RDA5807M FM Receiver	U1	SMD	1
2	STC15W404AS MCU	U2	DIP-28	1
3	IC Socket	U2	DIP-28	1
4	74HC595D Register	U3	SOP-16	1
5	TDA2822M Amplifier	U9	DIP-8	1
6	IC Socket	U9	DIP-8	1

7	AMS1117-3.3V Voltage Converter	U10	SOT-223	1
8	Metal Film Resistor	R2-R5,R16	10Kohm	5
9	Metal Film Resistor	R6,R17-R20	1Kohm	5
10	Metal Film Resistor	R7-R14	510ohm	8
11	Potentiometer	R1	200Kohm	1
12	Ceramic Capacitor	C1,C2,C6,C9	0.1uF 104	4
13	Electrolytic Capacitor	C3	1uF 50V	1
14	Electrolytic Capacitor	C4,C5,C7,C8	100uF 16V	4
15	S8550 Transistor	Q1-Q4	TO-92	4
16	Red LED	D1	3mm	1
17	4Bit Digital Tube	U7	Red	1
18	Toggle Switch	P5		1
19	SMD Micro USB Socket	DC	2Pin	1
20	Radio Antenna	U6	7.5cm-25cm	1
21	AUX Audio Socket	U4	3.5mm	1
22	Black Button	S1-S4	6*6*8mm	4
23	Button Cap	S1-S4		4
24	0.5W 8ohm Speaker	U8	D40mm	1
25	Red/Black Wire			1
26	Double-sided adhesive			2
27	AA*2 Battery Box			1
28	USB Power Wire			1
29	Acrylic Board			6
30	Nylon Column Screw		M3*8+6mm	4
31	M3 Screw		M3*5mm	4
32	M3 Nut			4
33	M2*22mm Screw			4
34	M2*6mm Screw			1
35	M2 Nut			5
36	PCB		95*58*1.6mm	1
Note:Users can complete the installation according to the PCB silk screen and component list.				

6.Application:

1>.Training welding skills
2>.Student school
3>.DIY production
4>.Project Design
5>.Electronic competition
6>.Gift giving
7>.Crafts collection
8>.Home decoration
9>.Souvenir collection
10>.Graduation design
11>.Holiday gifts

7.Note:

1>.It is a wireless module. So do not use it in an environment with signal interference.
2>.There are three SMD components so that you can place it on PCB and then fix by tin.
3>.It is not recommended to connect USB power supply and AA battery at the same time.

4>.Every time the power is turned on, the radio station and volume need to be readjusted.
5>.The display screen will remain ON all the time after power ON.

8.Installation Tips:

1>.User needs to prepare the welding tool at first.
1.1>.Soldering iron (<50 Watt)
1.2>.Rosin core ("radio") solder
1.3>.Wire cutters
1.4>.Wire strippers
1.5>.Philips screwdriver
2>.Please be patient until the installation is complete.
3>.The package is DIY kit.It need finish install by user.
4>.The soldering iron can't touch the components for a long time(1.0 second), otherwise it will damage the components.
5>.Pay attention to the positive and negative of the components.
6>.Strictly prohibit short circuit.
7>.User must install the LED according to the specified rules.Otherwise some LED will not light.
8>.Install complex components preferentially.
9>.Make sure all components are in right direction and right place.
10>.It is strongly recommended to read the installation manual before starting installation!!!
11>.Please wear anti-static gloves or anti-static wristbands when installing electronic components.

9. Installation Steps(Please be patient):

1>.Step 1: Install 1pcs SMD components SOP-16 74HC595D Register FM Receiver at U3. There is a white gap on PCB silk screen at U3 and there is a mark(dot) on IC. These two marks are corresponding to each other and are used to specify the installation direction.

2>.Step 2: Randomly choose a pad on the PCB, and then melt the solder on this pad.

3>.Step 3: Fix 74HC595D:
3.1.Use a soldering iron to melt tin on the pad just now and hold IC with tweezers in the other hand to place/press on U3 to prevent movement.
3.2.Take care to match and align each pins to pads.
3.3.Then remove soldering iron after align pins.
3.4.Then remove tweezers after solder tin cooling and solidification.

4>.Step 4: Connect others pads on 74HC595D to pads on PCB by tin and soldering iron. Tips for one method:
4.1>.Use a large amount of solder tin to cover all pads.
4.2>.Make sure all pins and pads are covered with tin.
4.3>.Use a soldering iron to keep the tin in the melting state. At the same time, use a solder sucker or desoldering braid to remove the excess solder.

5>.Step 5: Install 1pcs SOT-223 AMS1117-3.3V Voltage Converter at U10 by the same method.
6>.Step 6: Install 1pcs SMD RDA5807M FM Receiver at U1 by the same method.

7>.Step 7: Install 8pcs 510ohm Metal Film Resistor at R7-R14.
8>.Step 8: Install 5pcs 1Kohm Metal Film Resistor at R6,R17-R20.

9>.Step 9: Install 5pcs 10Kohm Metal Film Resistor at R2-R5,R16.
10>.Step 10: Install 1pcs 2Pin SMD Micro USB Socket at DC.

11>.Step 11: Install 1pcs DIP-28 IC Socket at U2.There is a gap mark on one end of the IC Socket and

there is a gap mark on PCB silk screen where the IC Socket can place on.These two marks are corresponding to each other and are used to specify the installation direction of the IC Socket.

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12>.Step 12: Install 1pcs DIP-8 IC Socket at U9.There is a gap mark on one end of the IC Socket and there is a gap mark on PCB silk screen where the IC Socket can place on.These two marks are corresponding to each other and are used to specify the installation direction of the IC Socket.

13>.Step 13: Install 1pcs 3mm Red LED at D1. Note: The longer pin connect to ‘ + ’ pad.

14>.Step 14: Install 4pcs 0.1uF 104 Ceramic Capacitor at C1,C2,C6,C9.

15>.Step 15: Install 1pcs 3.5mm AUX Audio Socket at U4.

16>.Step 16: Install 1pcs Toggle Switch at P5.

17>.Step 17: Install 4pcs 100uF 16V Electrolytic Capacitor at C4,C5,C7,C8. Pay attention to distinguish between positive and negative.The Longer pin is positive pole.

18>.Step 18: Install 1pcs TO-92 S8550 Transistor at Q1-Q4. Pay attention to the installation direction. The arc on the PCB corresponds to the arc of the components.

19>.Step 19: Install 1pcs 4Bit Red Digital Tube at U7.Pay attention to the installation direction of the decimal point.

20>.Step 20: Install 1pcs 1uF 50V Electrolytic Capacitor at C3.Pay attention to distinguish between positive and negative.The Longer pin is positive pole. Note: The capacitor needs to be placed horizontally, keep a distance of 2mm between the capacitor and the PCB when installing.

21>.Step 21: Install 1pcs 200Kohm Potentiometer at R1.

22>.Step 22: Install 4pcs 6*6*8mm Black Button at S1-S4. Ensure that the buttons are installed vertically to avoid affecting the next installation of acrylic plates.

23>.Step 23: Install 1pcs DIP-28 STC15W404AS MCU at U2.There is a gap mark on one end of the IC and there is a gap mark on DIP-28 IC Socket where the IC can place on.These two marks are corresponding to each other and are used to specify the installation direction of the IC.

24>.Step 24: Install 1pcs DIP-8 TDA2822M Amplifier at U9.There is a gap mark on one end of the IC and there is a gap mark on DIP-8 IC Socket where the IC can place on.These two marks are corresponding to each other and are used to specify the installation direction of the IC.

25>.Step 25: Install 1pcs Red/Black wire to 0.5W 8ohm Speaker.

26>.Step 26: Connect 0.5W 8ohm Speaker to PCB.

27>.Step 27: Fix FM Radio Antenna at U6 on PCB back by M2*6mm Screw and M2 Nut. Then use a large amount of solder tin to cover the screw and nut to ensure that the antenna will not fall off during use.

28>.Step 28: Connect AA*2 battery box to PCB. Red wire to ‘ + ’ pad.

29>.Step 29: Paste the speaker and battery box on the PCB back with double-sided adhesive tape, and pay attention to the white line area on the PCB to define their positions.

30>.Step 30: Fix 4pcs M3*8+6mm Nylon Column Screw on PCB by 4pcs M3 Nut.

31>.Step 31: Tear off the protective film on the surface of the acrylic shell.

32>.Step 32: Fix Bottom Acrylic Board by 4pcs M3*5mm Screw.

33>.Step 33: Place 4pcs Side Acrylic Board.

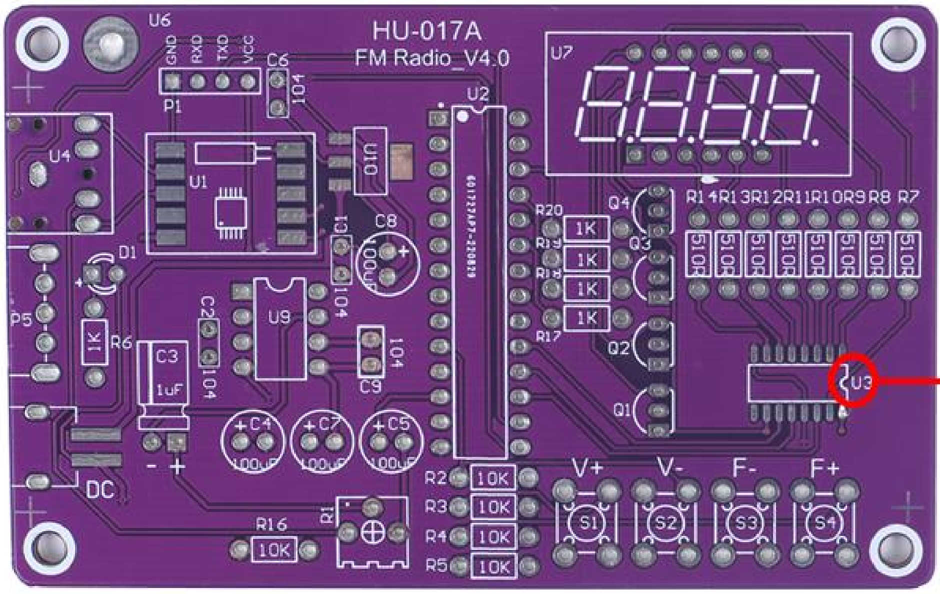
34>.Step 34: Fix Top Acrylic Board by 4pcs M2*22mm Screw and 4pcs M2 Nut.

35>.Step 35: Connect to power supply and enjoy the effect.

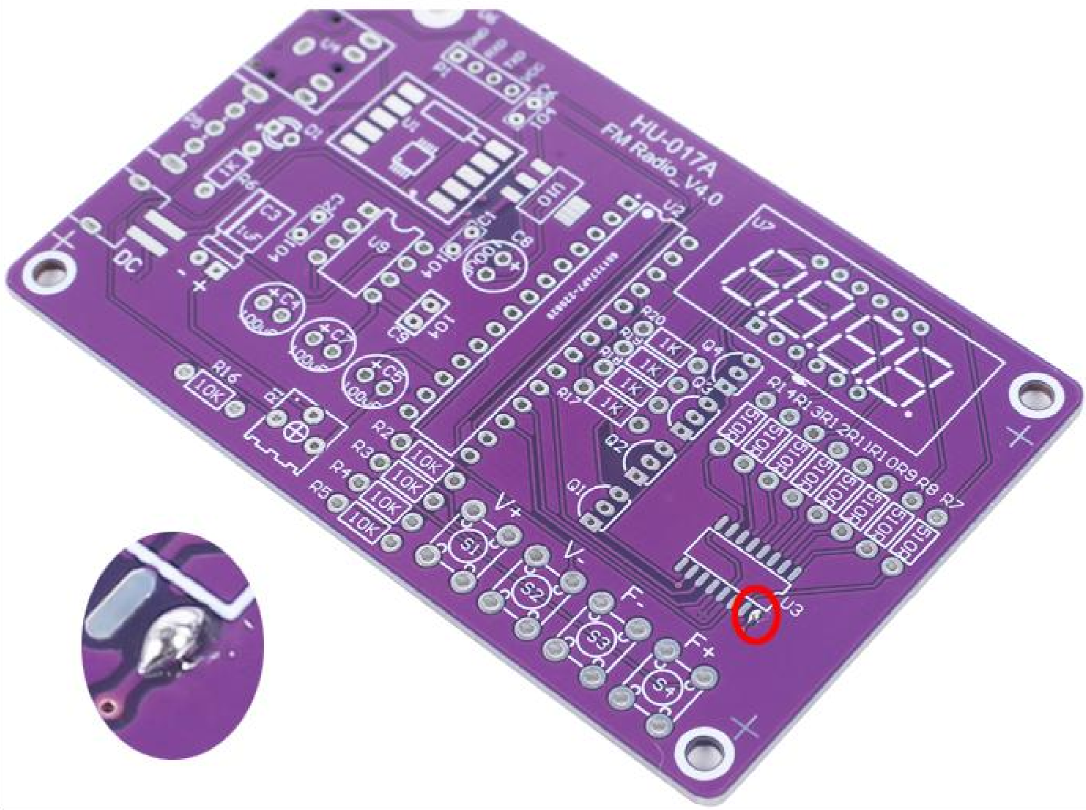
10.Install shown steps:

Step 1: Install 1pcs SMD components SOP-16 74HC595D Register FM Receiver at U3. There is a white gap on PCB silk at U3 and there is a mark(dot) on IC. These two marks are corresponding to each other and are used to specify the installation direction.

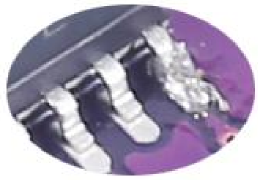


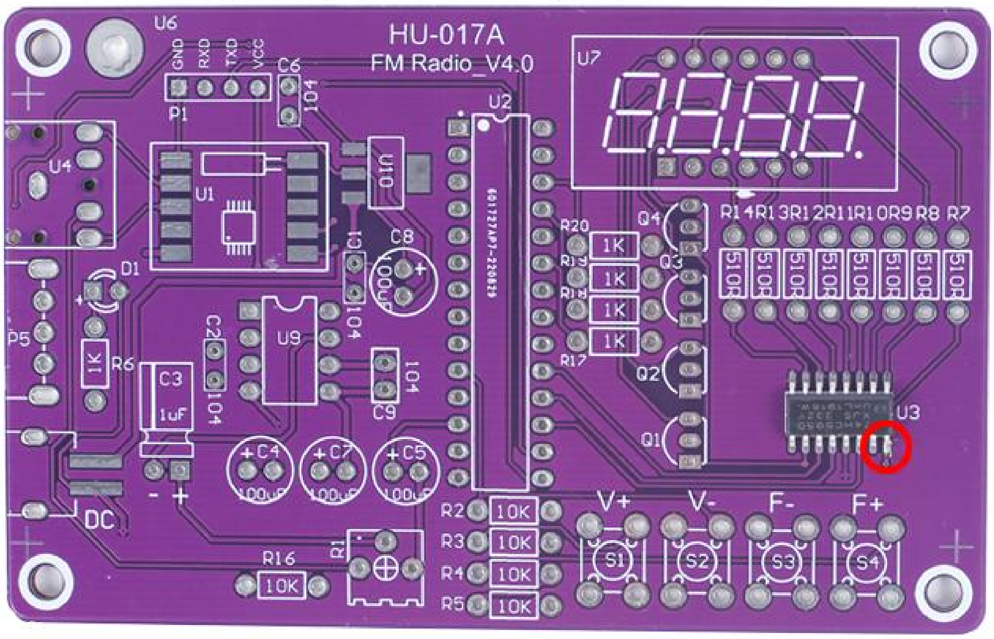


Step 2: Randomly choose a pad on the PCB, and then melt the solder on this pad.



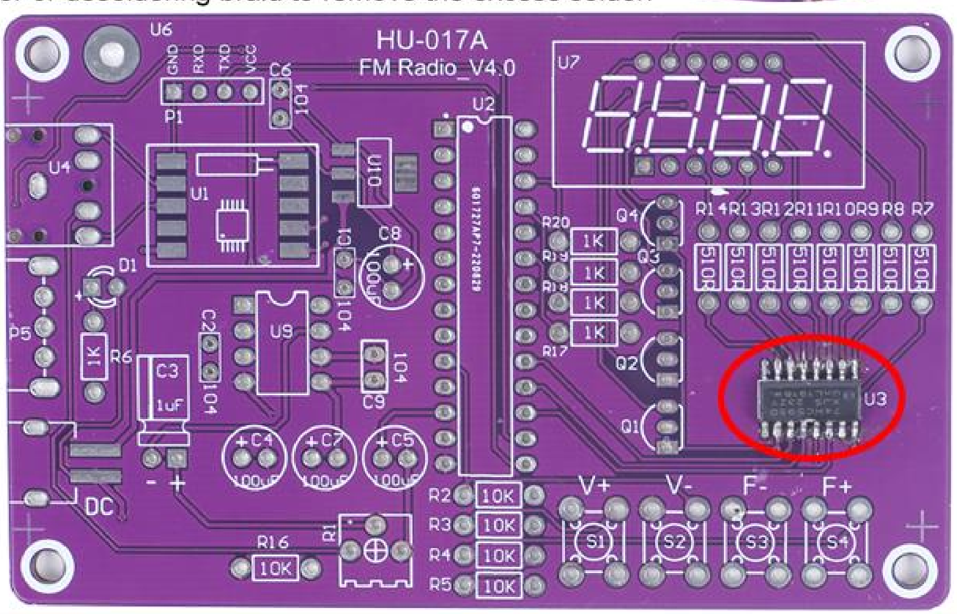
Step 3: Fix 74HC595D:
3.1.Use a soldering iron to melt tin on the pad just now and hold IC with tweezers in the other hand to place/press on U3 to prevent movement.
3.2.Take care to match and align each pins to pads.
3.3.Then remove soldering iron after align pins.
3.4.Then remove tweezers after solder tin cooling and solidification.





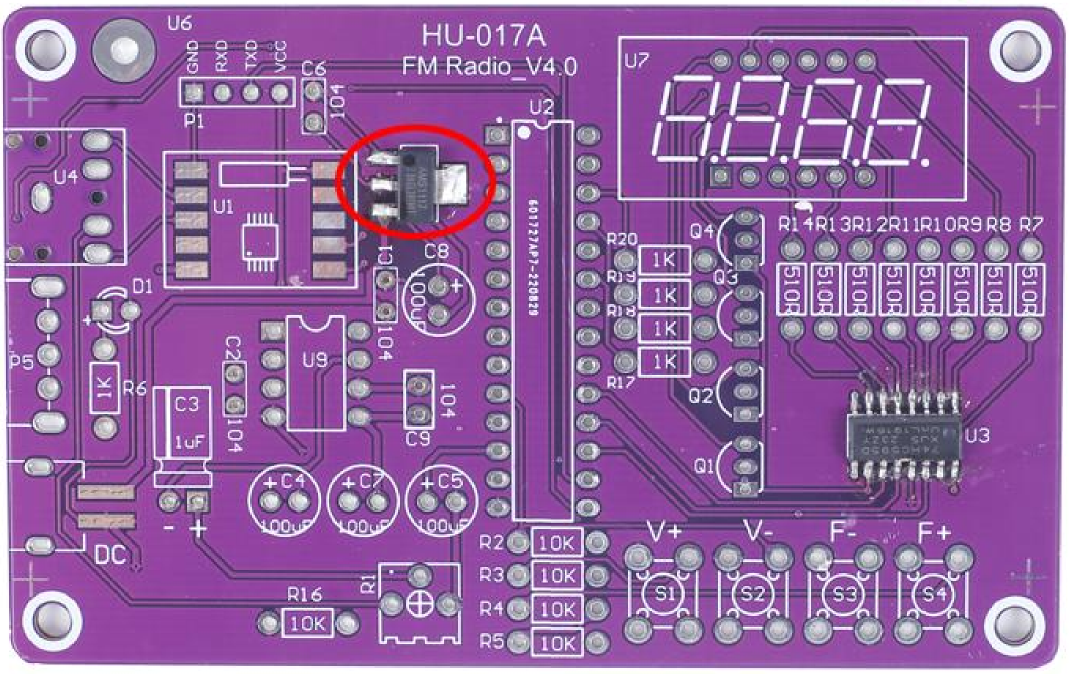
Step 4: Connect others pads on 74HC595D to pads on PCB by tin and soldering iron.
Tips for one method:
1>.Use a large amount of tin to cover all pads.
2>.Make sure all pins & pads are covered3
3>.Use a soldering iron to keep the tin in the melting state. At the same time, use a solder sucker or desoldering braid to remove the excess solder.





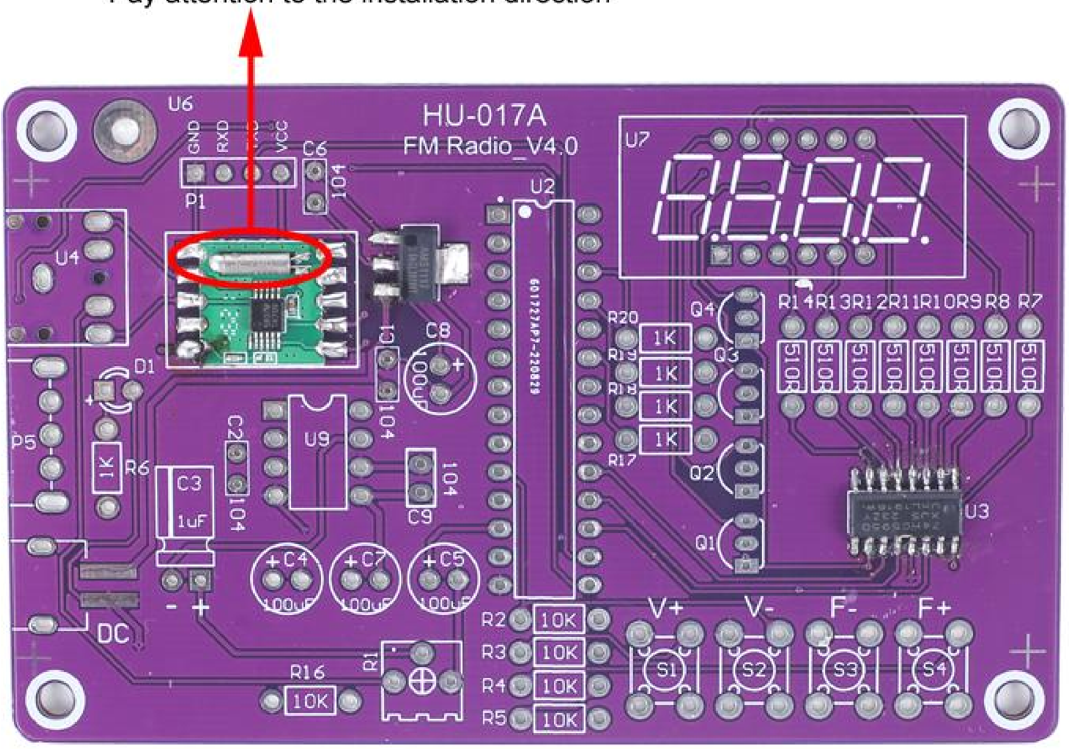
Step 5: Install 1pcs SOT-223 AMS1117-3.3V Voltage Converter at U10 by the same method.





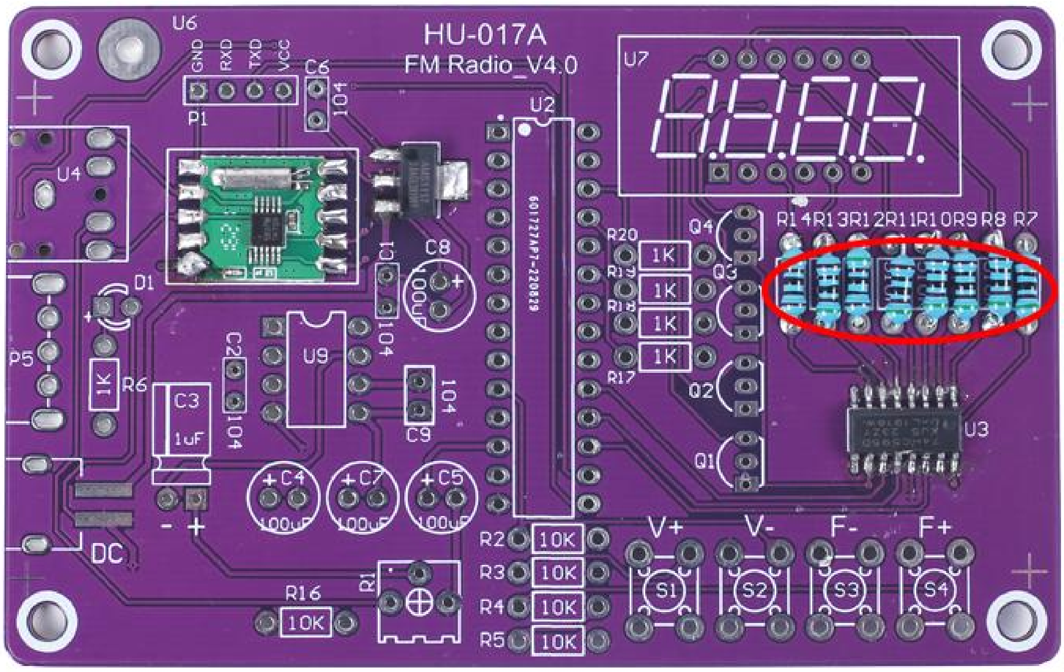
Step 6: Install 1pcs SMD RDA5807M FM Receiver at U1 by the same method.

Pay attention to the installation direction



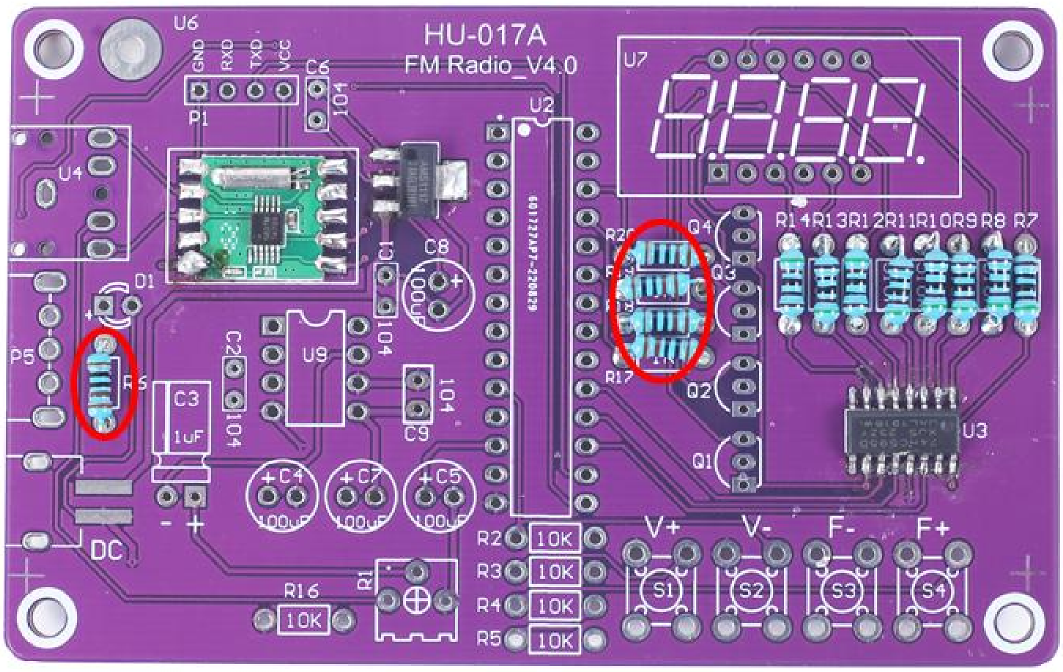
Step 7: Install 8pcs 510ohm Metal Film Resistor at R7-R14.



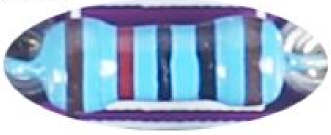


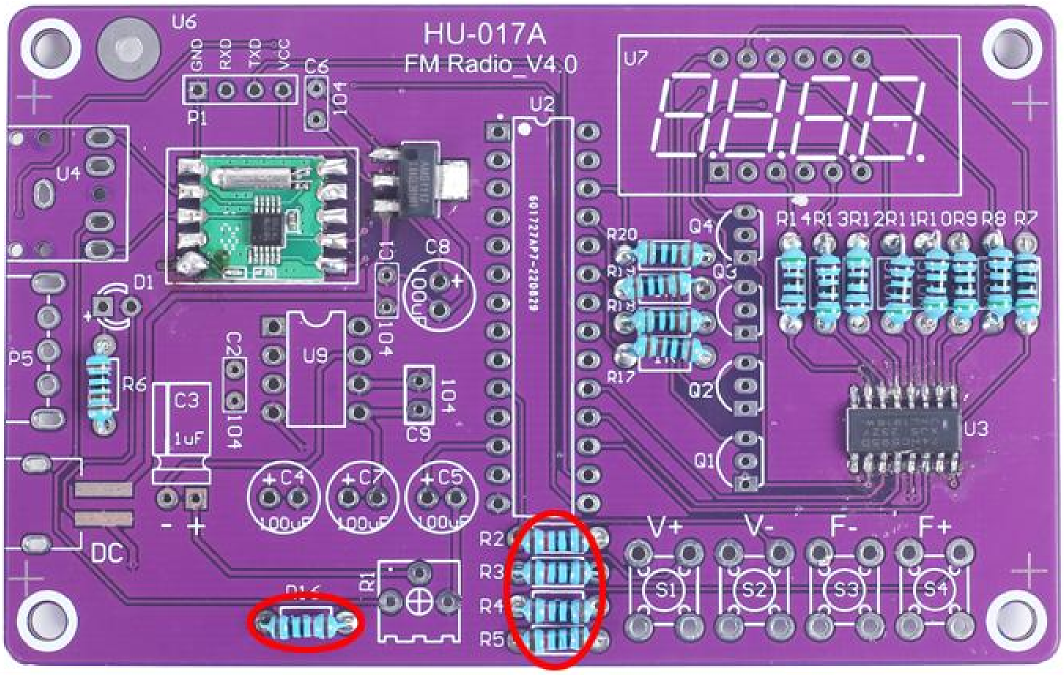
Step 8: Install 5pcs 1Kohm Metal Film Resistor at R6,R17-R20.



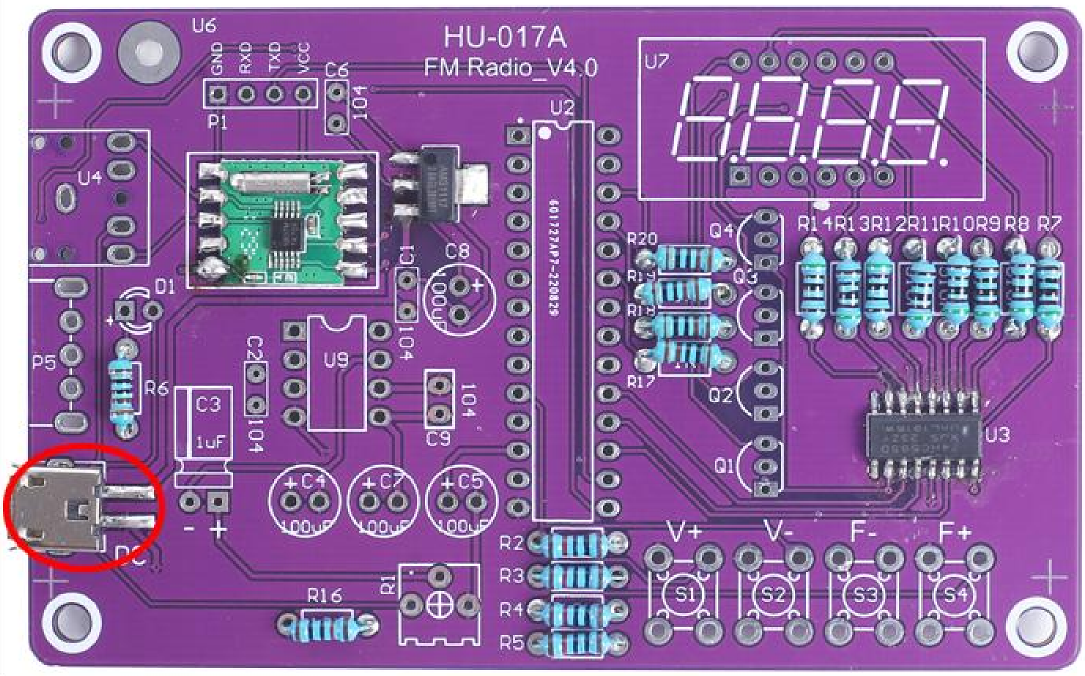


Step 9: Install 5pcs 10Kohm Metal Film Resistor at R2-R5,R16.

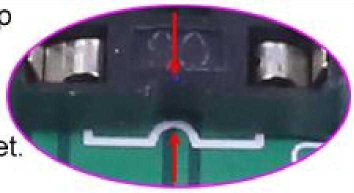


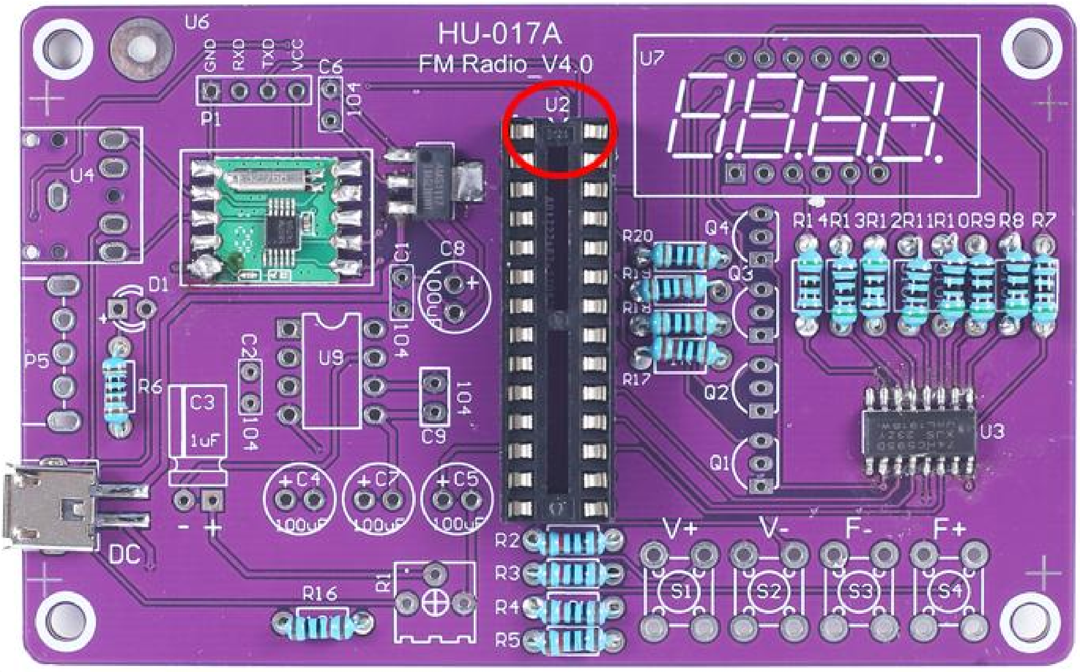


Step 10: Install 1pcs 2Pin SMD Micro USB Socket at DC.

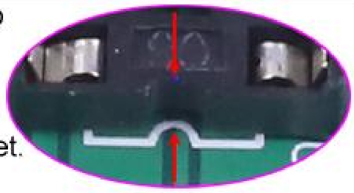


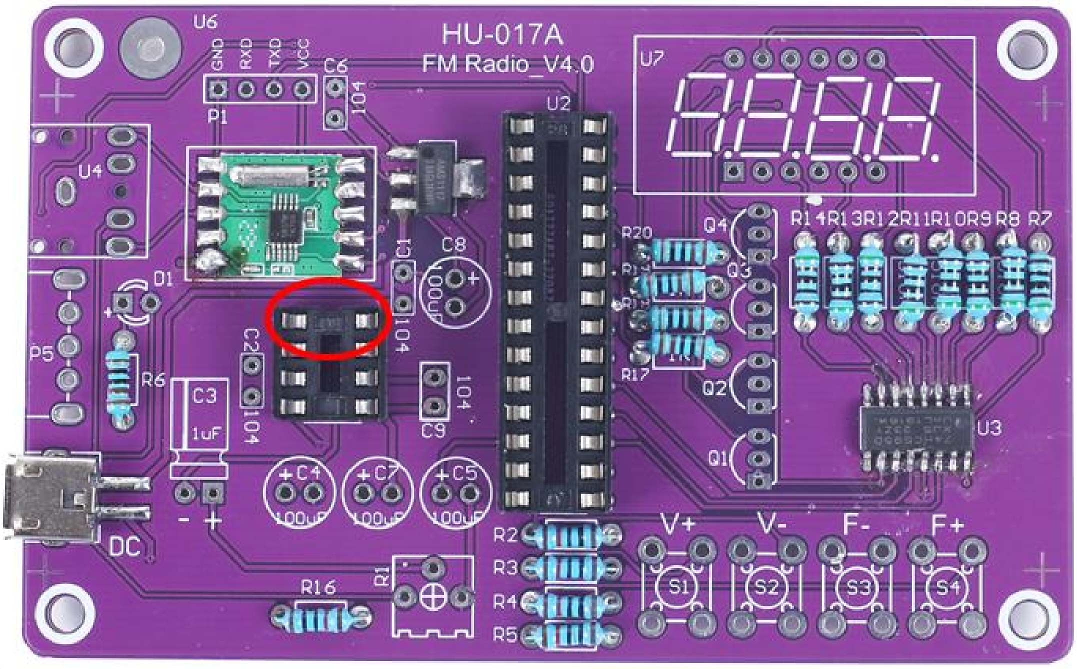
Step 11: Install 1pcs DIP-28 IC Socket at U2.There is a gap mark on one end of the IC Socket and there is a gap mark on PCB silk screen where the IC Socket can place on. These two marks are corresponding to each other and are used to specify the installation direction of the IC Socket.





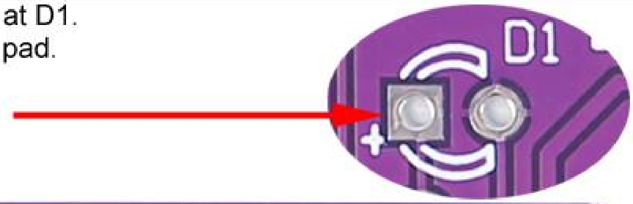
Step 12: Install 1pcs DIP-8 IC Socket at U9. There is a gap mark on one end of the IC Socket and there is a gap mark on PCB silk screen where the IC Socket can place on. These two marks are corresponding to each other and are used to specify the installation direction of the IC Socket.

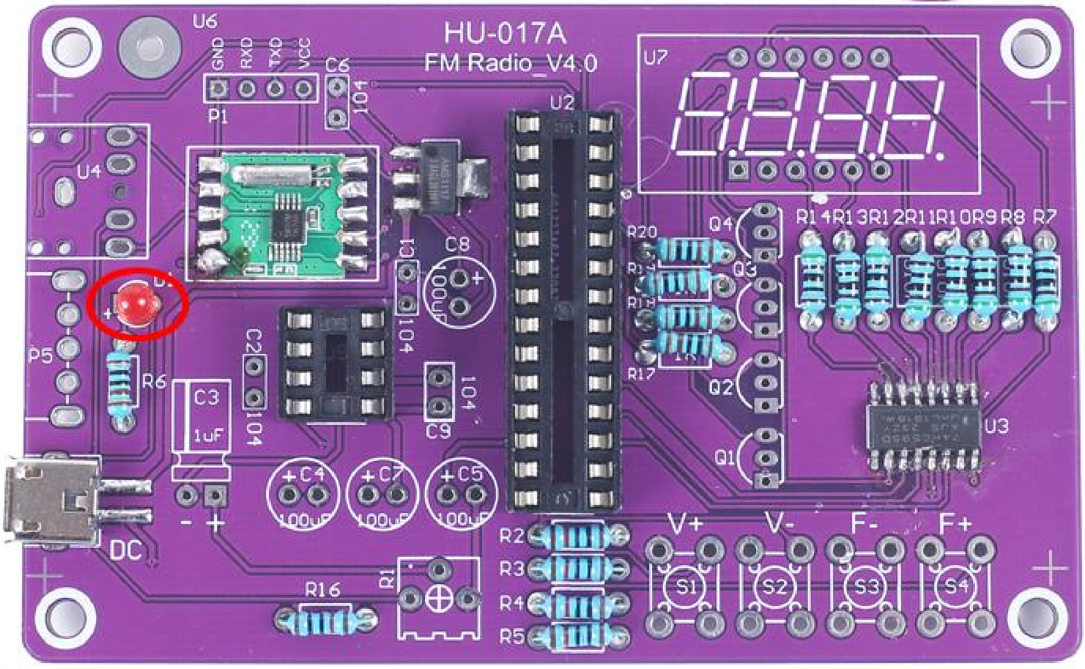




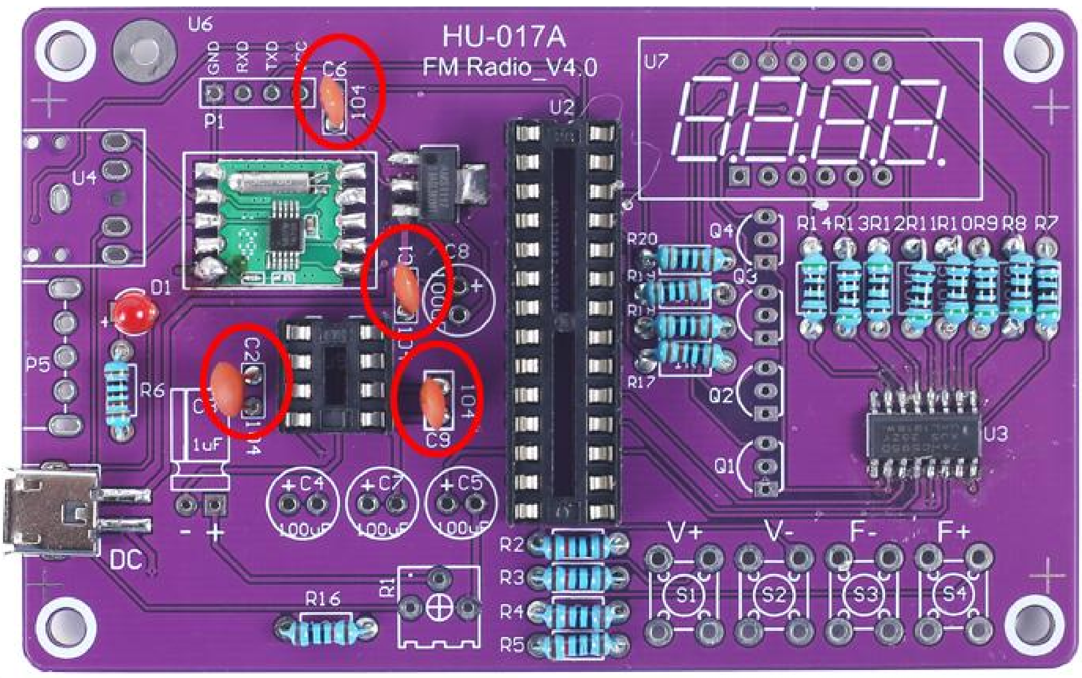
Step 13: Install 1pcs 3mm Red LED at D1.

Note: The longer pin connect to ' + ' pad.

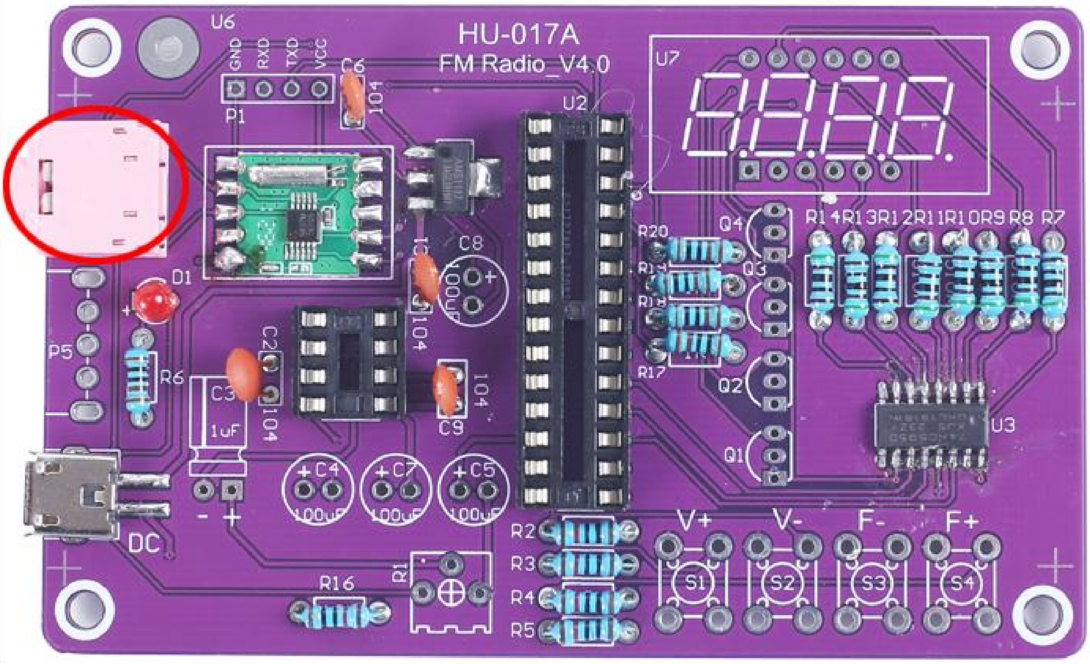




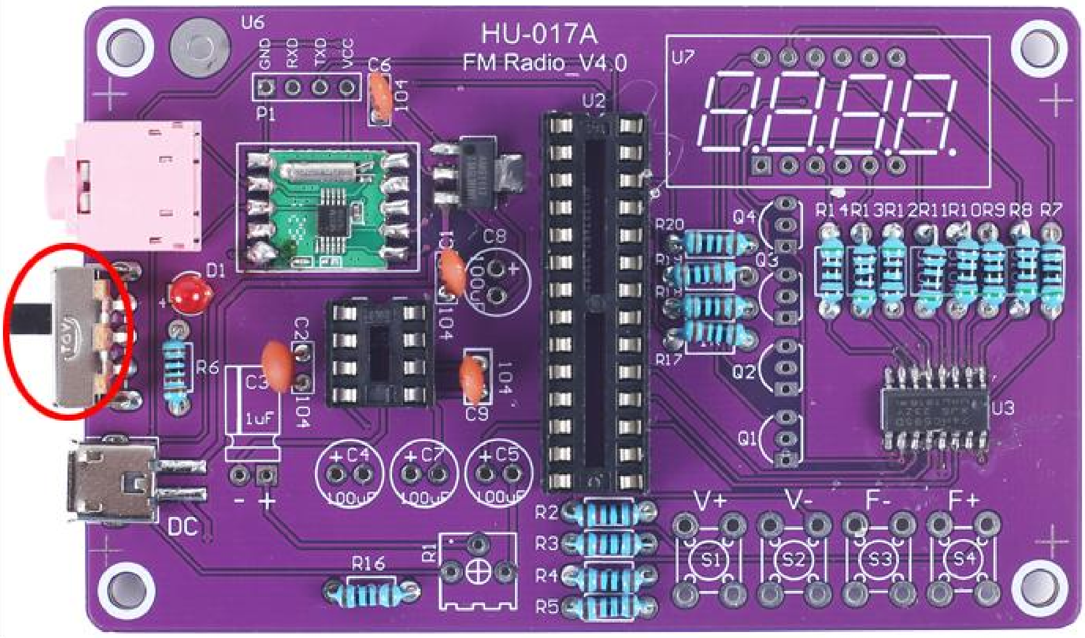
Step 14: Install 4pcs 0.1uF 104 Ceramic Capacitor at C1,C2,C6,C9.



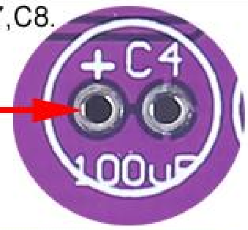
Step 15: Install 1pcs 3.5mm AUX Audio Socket at U4.

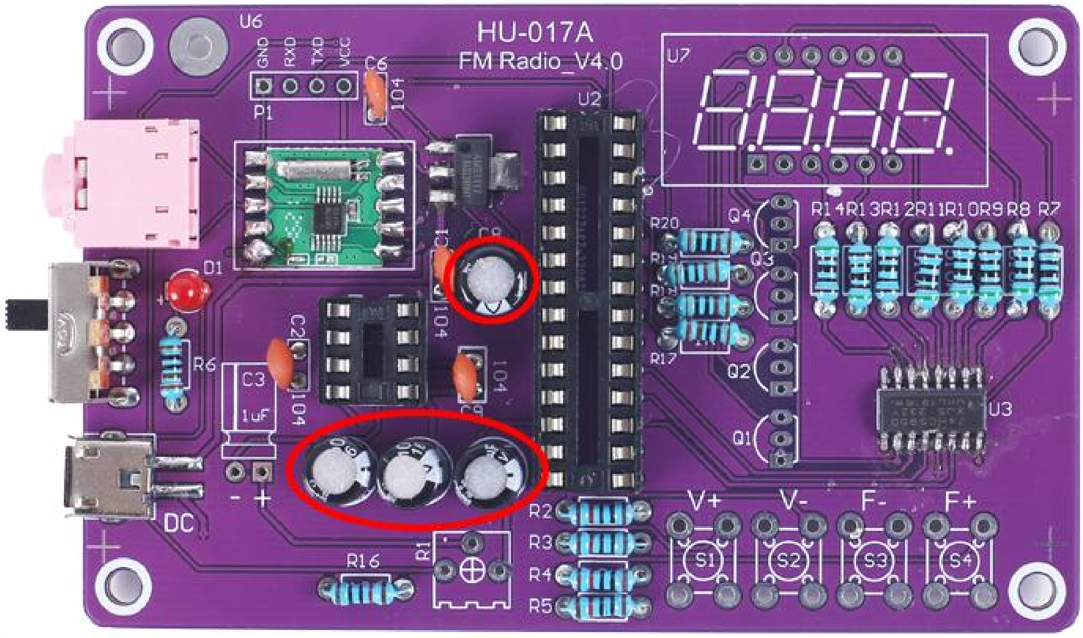


Step 16: Install 1pcs Toggle Switch at P5.



Step 17: Install 4pcs 100uF 16V Electrolytic Capacitor at C4,C5,C7,C8.
Pay attention to distinguish between positive and negative.
The Longer pin is positive pole.

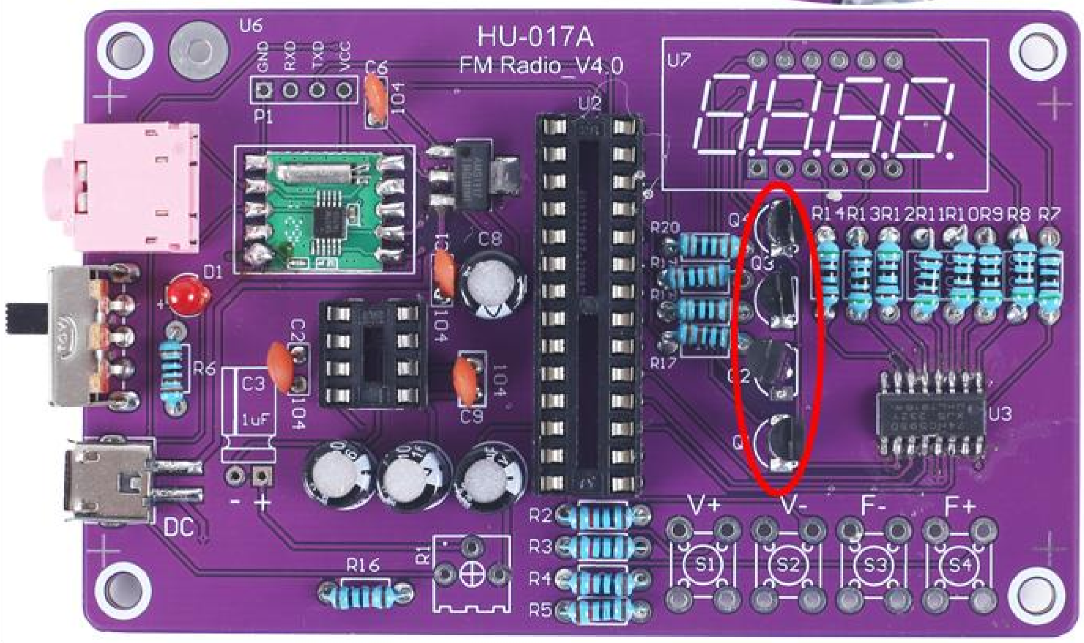




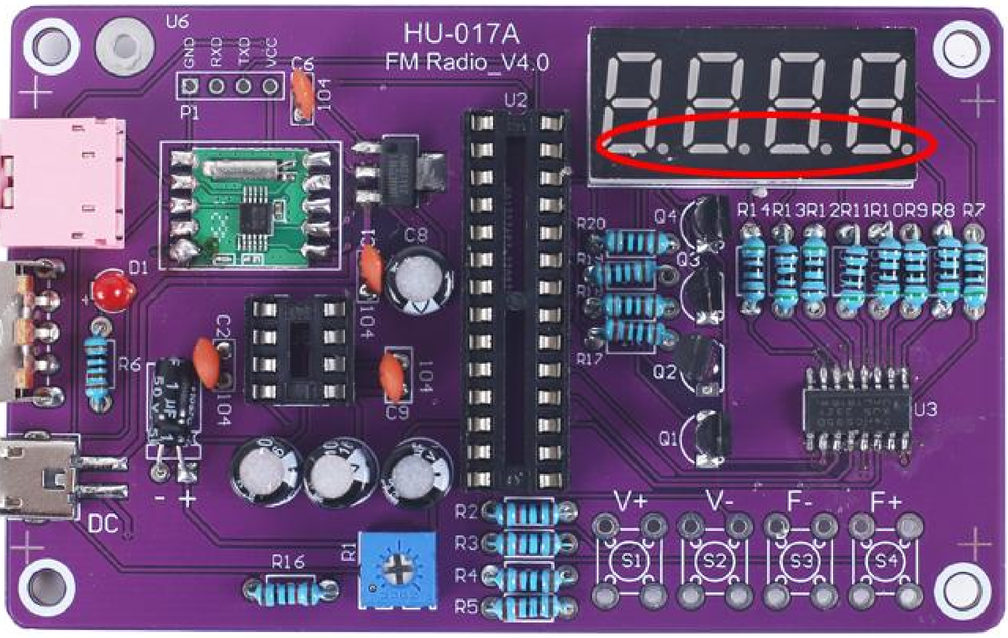
Step 18: Install 1pcs TO-92 S8550 Transistor at Q1-Q4.
Pay attention to the installation direction.
The arc on the PCB corresponds to the arc of the components.

arc-shaped



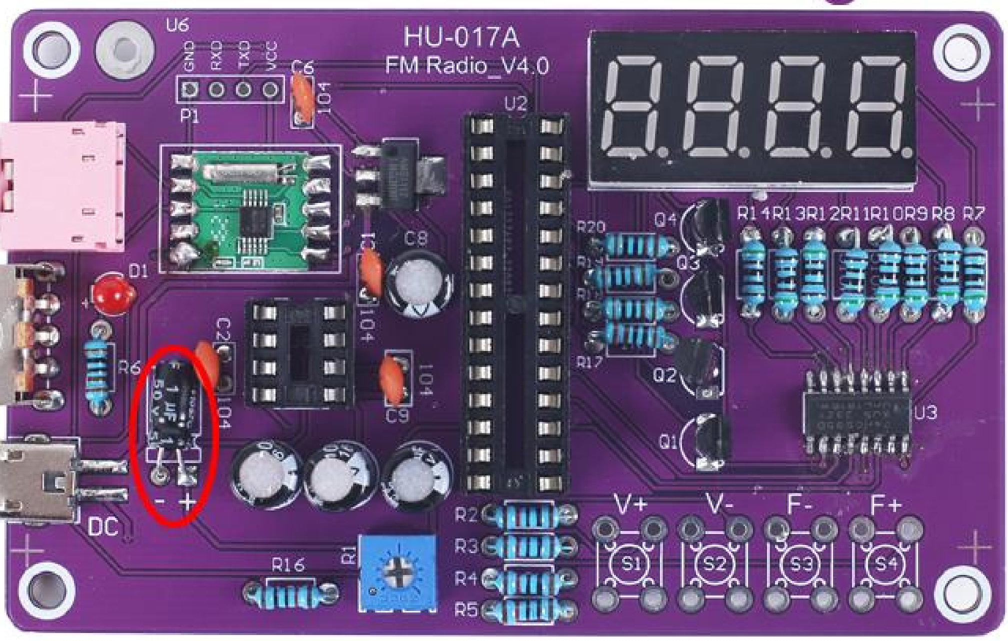


Step 19: Install 1pcs 4Bit Red Digital Tube at U7.
Pay attention to the installation direction of the decimal point.

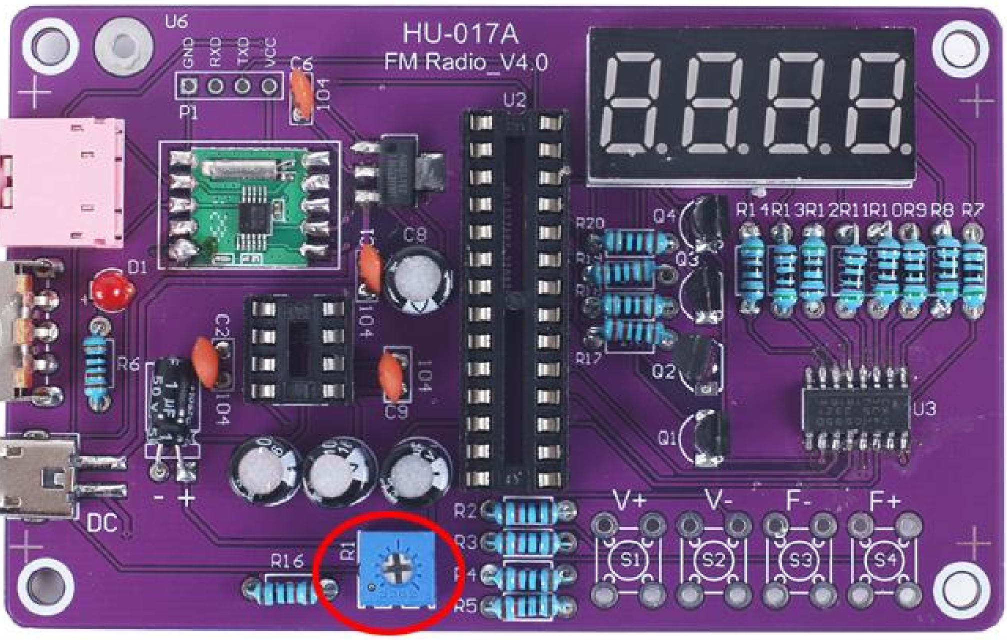


Step 20: Install 1pcs 1uF 50V Electrolytic Capacitor at C3.
Pay attention to distinguish between positive and negative.
The Longer pin is positive pole.
Note: The capacitor needs to be placed horizontally, keep a distance of 2mm between the capacitor and the PCB when installing.



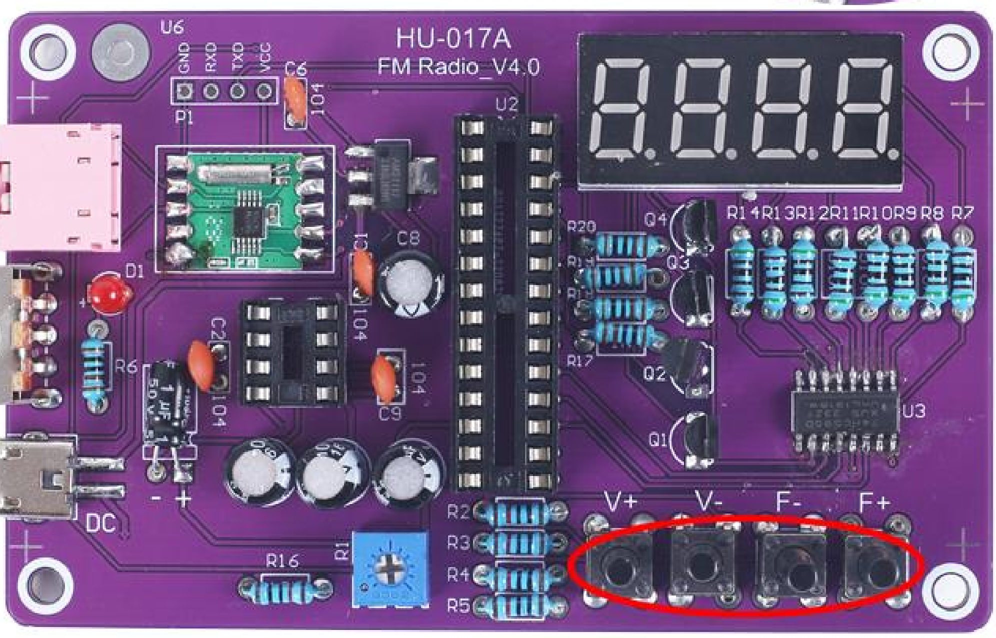


Step 21: Install 1pcs 200Kohm Potentiometer at R1.



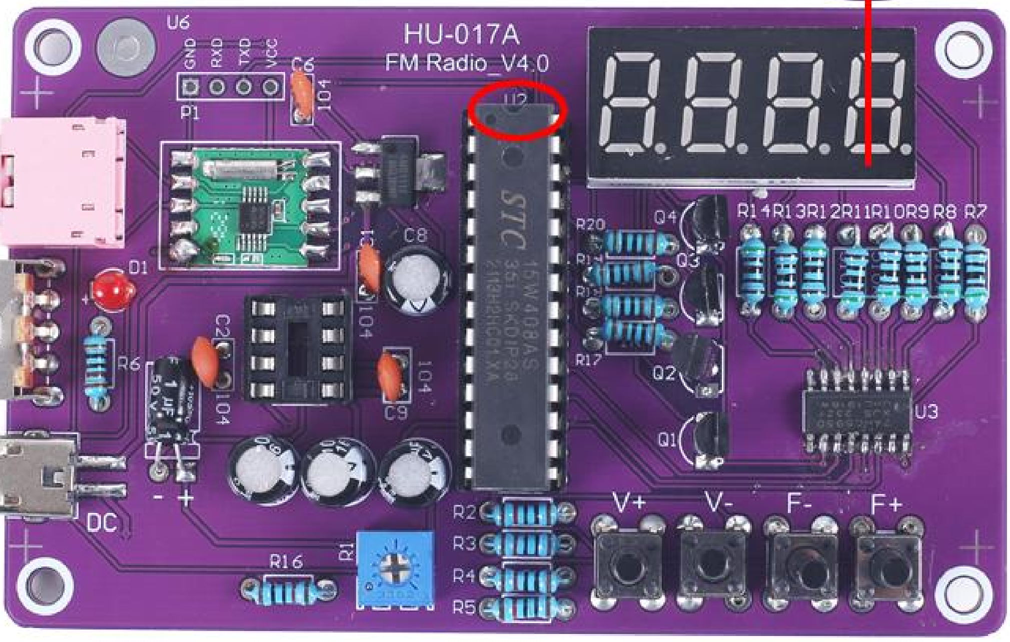
Step 22: Install 4pcs 6*6*8mm Black Button at S1-S4.
Ensure that the buttons are installed vertically to avoid affecting the next installation of acrylic plates.





Step 23: Install 1pcs DIP-28 STC15W404AS MCU at U2. There is a gap mark on one end of the IC and there is a gap mark on DIP-28 IC Socket where the IC can place on. These two marks are corresponding to each other and are used to specify the installation direction of the IC.



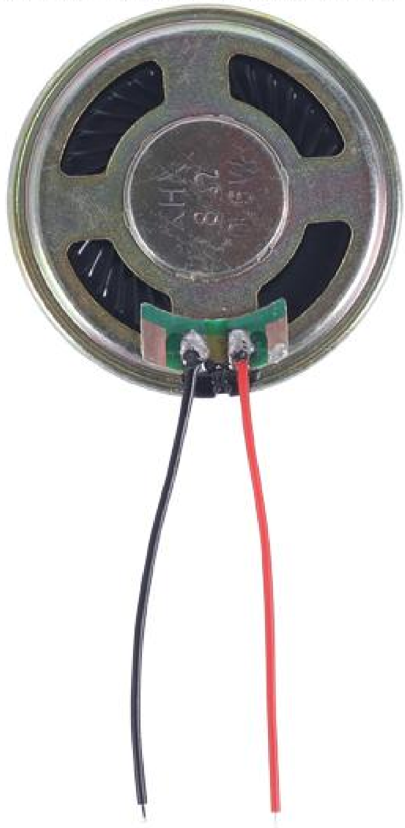


Step 24: Install 1pcs DIP-8 TDA2822M Amplifier at U9. There is a gap mark on one end of the IC and there is a gap mark on DIP-8 IC Socket where the IC can place on. These two marks are corresponding to each other and are used to specify the installation direction of the IC.

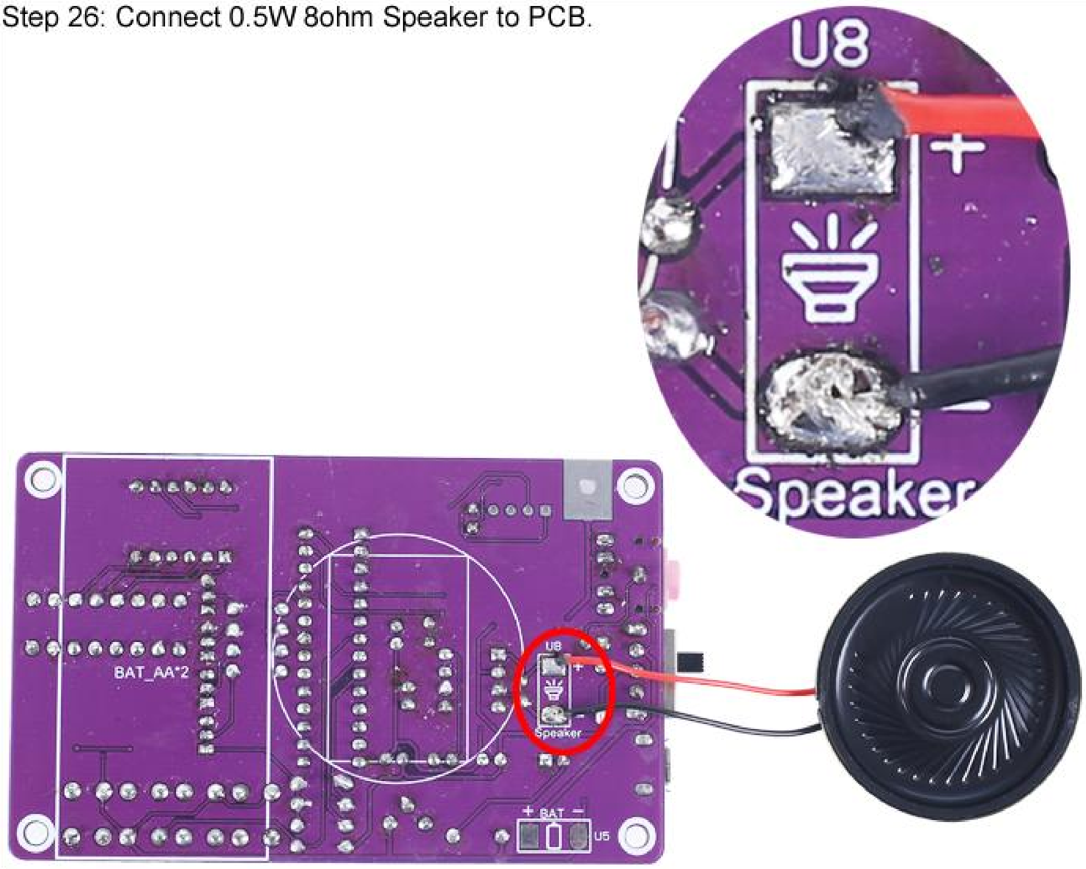




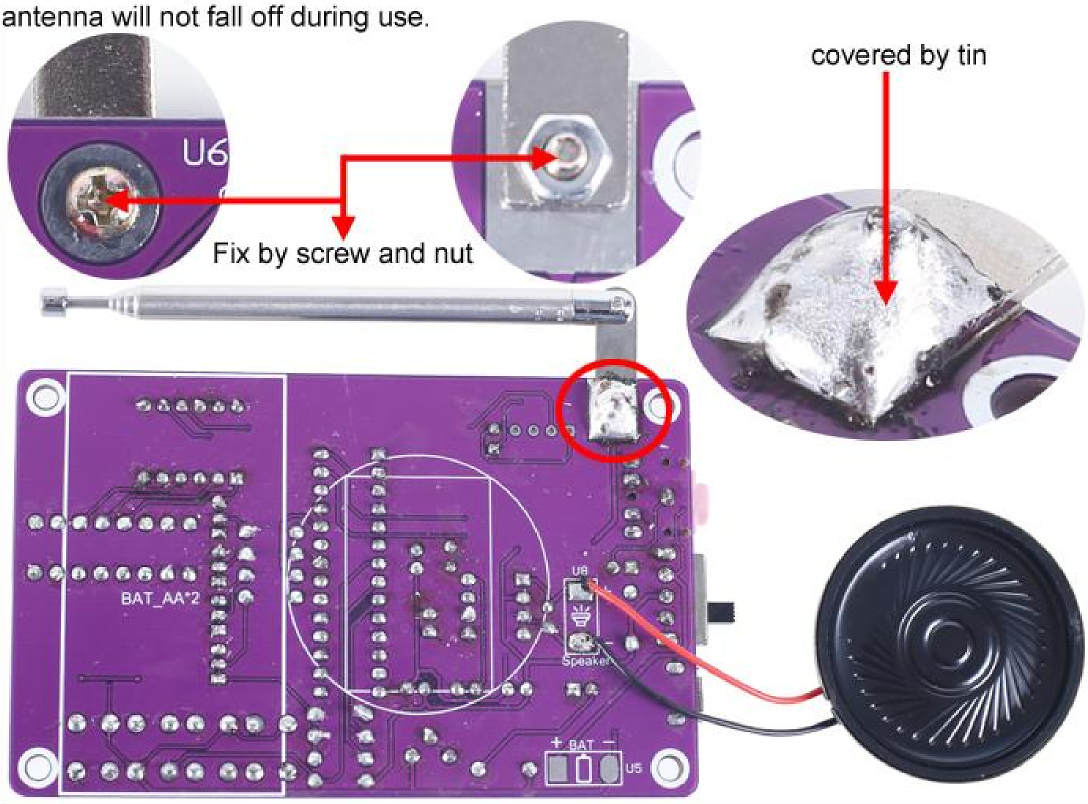
Step 25: Install 1pcs Red/Black wire to 0.5W 8ohm Speaker.



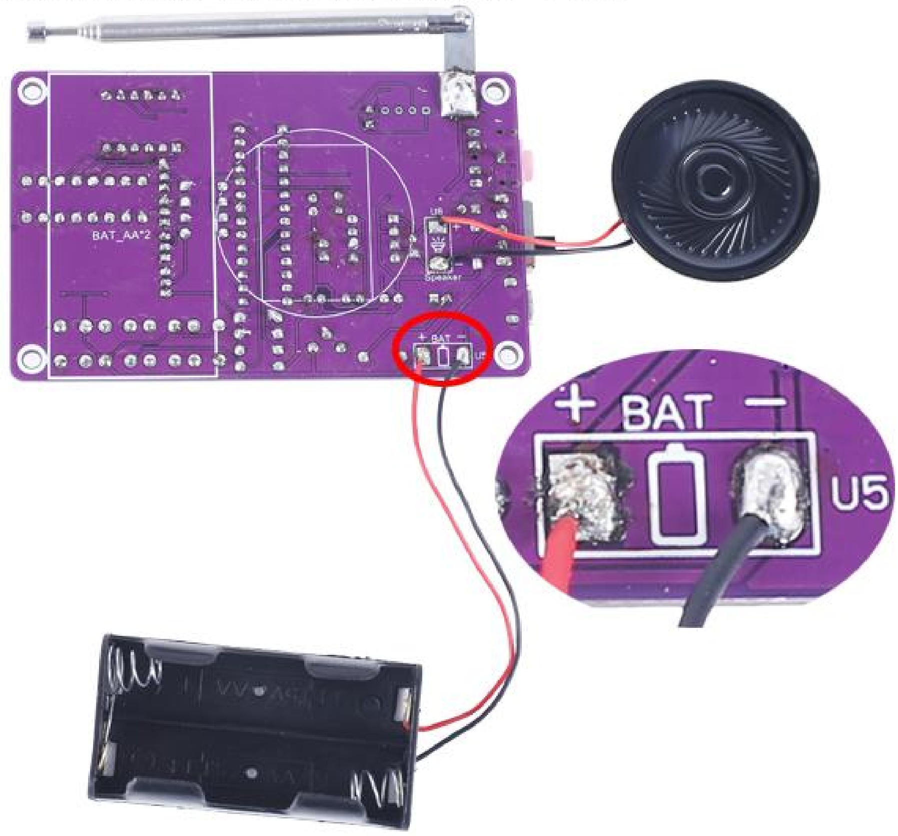
Step 26: Connect 0.5W 8ohm Speaker to PCB.



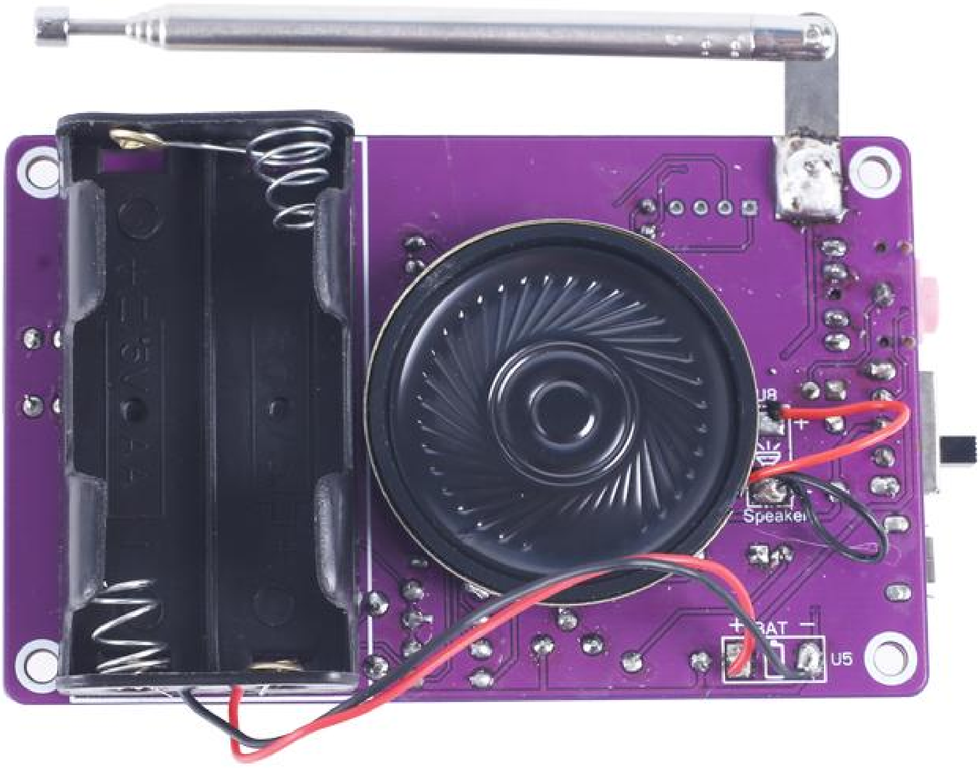
Step 27: Fix FM Radio Antenna at U6 on PCB back by M2*6mm Screw and M2 Nut. Then use a large amount of solder tin to cover the screw and nut to ensure that the antenna will not fall off during use.



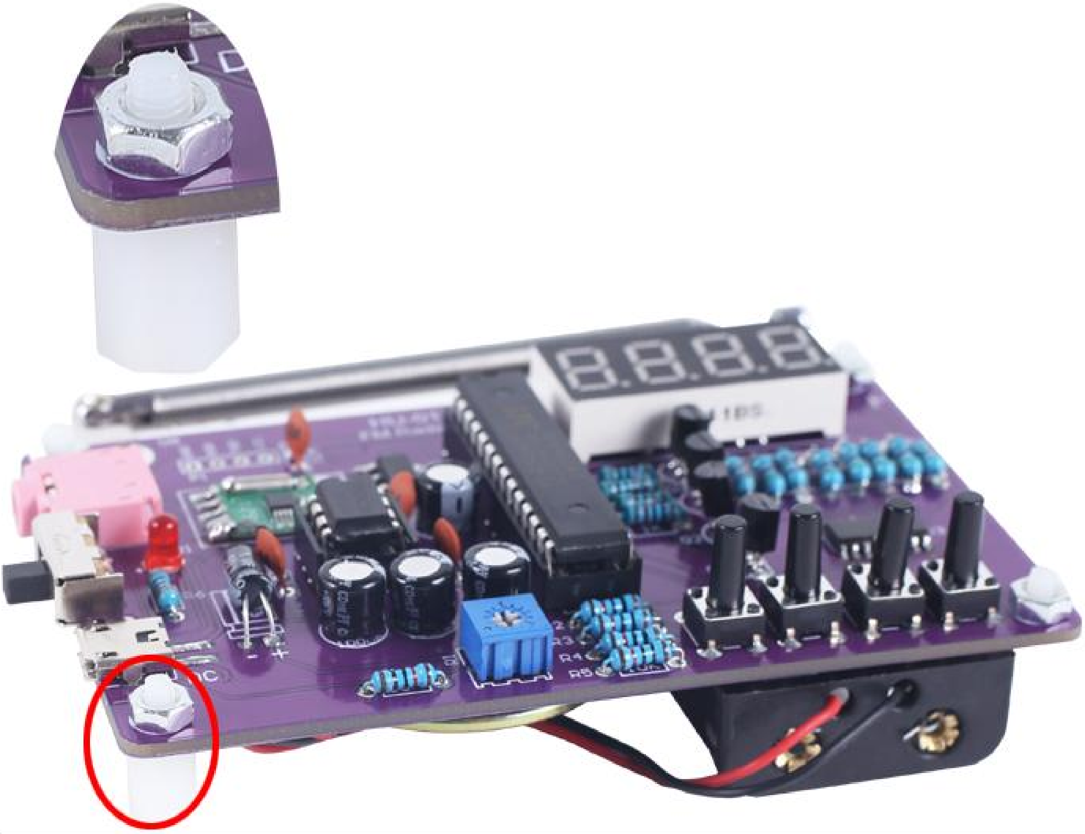
Step 28: Connect AA*2 battery box to PCB. Red wire to ‘ + ’ pad.



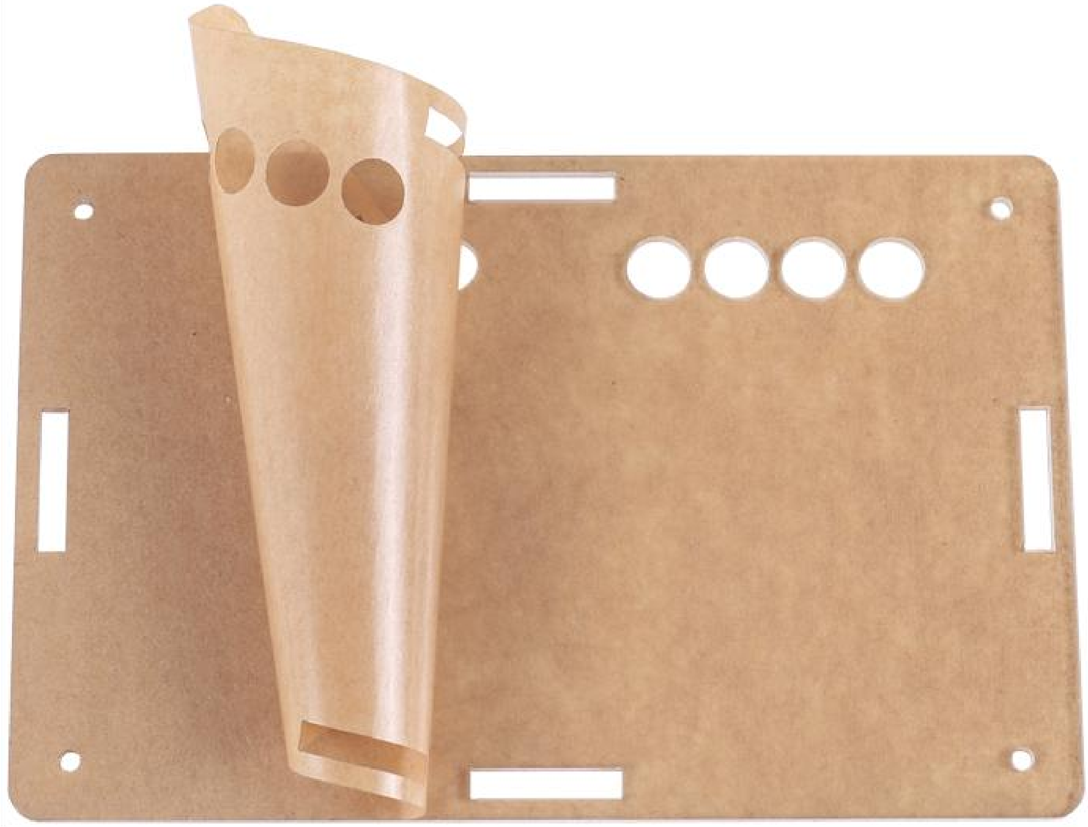
Step 29: Paste the speaker and battery box on the PCB back with double-sided adhesive tape, and pay attention to the white line area on the PCB to define their positions.



Step 30: Fix 4pcs M3*8+6mm Nylon Column Screw on PCB by 4pcs M3 Nut.



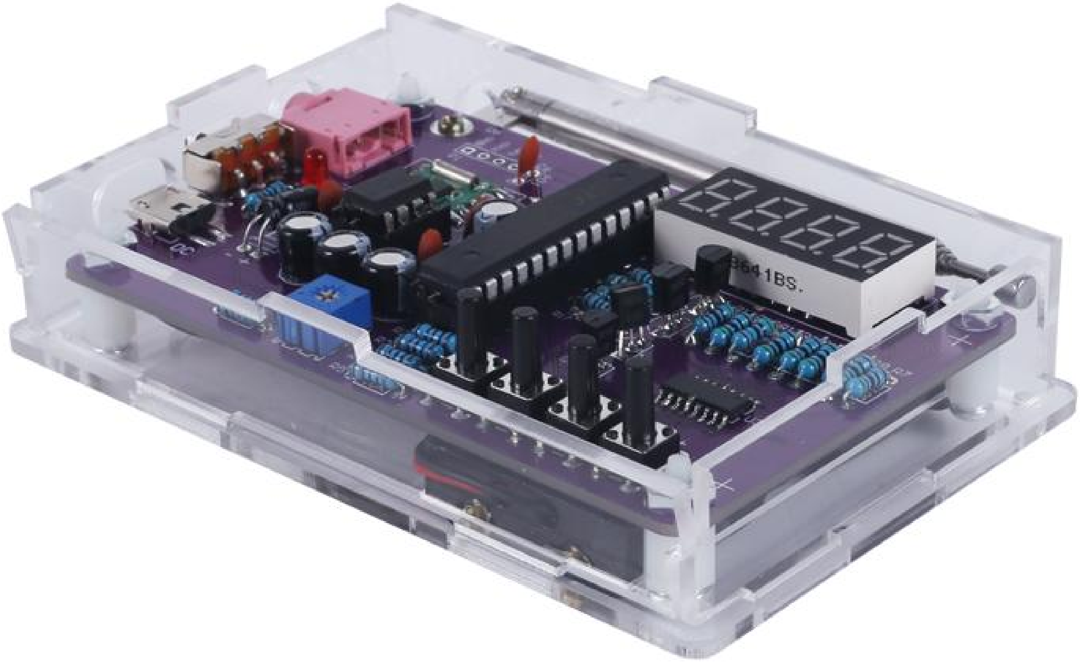
Step 31: Tear off the protective film on the surface of the acrylic shell.



Step 32: Fix Bottom Acrylic Board by 4pcs M3*5mm Screw.



Step 33: Place 4pcs Side Acrylic Board.



Step 34: Fix Top Acrylic Board by 4pcs M2*22mm Screw and 4pcs M2 Nut.
Step 35: Connect to power supply and enjoy the effect.

